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10/087,632	03/01/2002	Terry J. Ahrendt	H0002703	3697
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HONEYWELL INTERNATIONAL INC. 101 COLUMBIA ROAD P O BOX 2245 MORRISTOWN, NJ 07962-2245			HARRIS, ANTON B	
			ART UNIT	PAPER NUMBER
			2831	

DATE MAILED: 04/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/087,632

Applicant(s)AHRENDT, TERRY J. **Examiner**

Anton B Harris

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>01 March 2002</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Objections

1. Claim 12 is objected to because of the following informalities:

Claim 12 line 2, recites, “a solenoid coupled electrically coupled...”. The first occurrence of the word “coupled” should be deleted for clarification. The Office interprets the phrase to be “a solenoid electrically coupled...”. Appropriate correction is required.

Any further rejection of, or indications of the allowability of claim 12 are based on claim 12, as it is understood by the Office.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-12 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Clapp, III (5,412,531) in view of Kates et al. (6,130,813) and Matsuura (5,452,700 cited by Applicant).

Regarding claim 1, Clapp, III (col. 2, lines 28-67) discloses a circuit comprising:

a first controllable switch 20,

a second controllable switch 22;

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a diode 62 electrically coupled in series between the first controllable switch 20 and the second controllable switch 22;

a controller circuit 14, but lacks a switch electrically coupled in parallel with a resistive element and a controllable switch electrically coupled in series with a resistor.

Kates et al. (col. 4, lines 43-47) teaches a switch 110 electrically coupled in parallel with a resistive element 115.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the modified device of Clapp, III by providing a switch electrically coupled in parallel with a resistive element in order to allow a small amount of current to flow from the power source to the load in view of the teachings of Kates et al.

Matsuura (col. 4, lines 45-52) teaches a controllable switch 70 electrically coupled in series with a resistor 71.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device of Clapp, III by providing a controllable switch electrically coupled in series with a resistor in order to detect current in view of the teachings of Matsuura.

Furthermore, the limitations of “operable to (i) selectively open and close the first controllable switch and the second controllable switch in response to a command signal and (ii) selectively open and close the second controllable switch based on a magnitude of current flow through the solenoid” in claim 1 have been considered, but do not result in a structural difference. The presence of process limitations in product claims, which product does not

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otherwise patentably distinguish over prior art, cannot impart patentability to that product. *In re Stephens*, 145 USPQ 656 (CCPA 1965).

Regarding claim 2, Clapp, III modified by Matsuura and Kates et al. discloses the invention substantially as claimed including a driver circuit 12 having at least a first input 24 coupled to the switch control and a solenoid 108, but lacks a comparator circuit having at least a first input terminal coupled to a reference voltage, a second input terminal, and a third input terminal.

Matsuura (col. 4, lines 53-67) further teaches a comparator 75 circuit having at least a first input terminal coupled to a reference voltage, a second input terminal coupled, and a third input terminal. See figure 1.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the modified device of Clapp, III by providing a comparator circuit having at least a first input terminal coupled to a reference voltage, a second input terminal, and a third input terminal in order to drive the switching transistor in view of the teachings of Matsuura.

Furthermore, the limitations of “to receive a voltage signal representative of a current magnitude flowing through the solenoid”; “to receive the command signal, the comparator operable to supply a switch control signal based on the signals on the first, second, and third input terminals”; and “to receive the switch control signal and operable, in response thereto, to selectively open and close the second controllable switch” in claim 2 have been considered, but do not result in a structural difference. The presence of process limitations in product claims,

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which product does not otherwise patentably distinguish over prior art, cannot impart patentability to that product. *In re Stephens*, 145 USPQ 656 (CCPA 1965).

Regarding claim 3, Clapp, III (figure 2) discloses a driver circuit 12 having at least a second input 104.

Furthermore, the limitation of “coupled to receive the command signal and operable, in response thereto, to selectively open and close the first controllable switch and the second controllable switch” in claim 3 has been considered, but do not result in a structural difference. The presence of process limitations in product claims, which product does not otherwise patentably distinguish over prior art, cannot impart patentability to that product. *In re Stephens*, 145 USPQ 656 (CCPA 1965).

Regarding claim 4, Clapp, III (figure 1) discloses that the controller 14 circuit further comprising an input circuit.

Furthermore, the limitation of “operable to condition the command signal and supply the conditioned command signal to the driver circuit second input and the comparator circuit third input” in claim 4 has been considered, but does not result in a structural difference. The presence of process limitations in product claims, which product does not otherwise patentably distinguish over prior art, cannot impart patentability to that product. *In re Stephens*, 145 USPQ 656 (CCPA 1965).

Regarding claim 5, Clapp, III modified as taught by Matsuura and Kates et al. in claim 2 discloses the invention substantially as claimed, and Matsuura further teaches a comparator 75 having a comparator output terminal (right of reference line 75 in figure1), and a logical AND 78

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circuit having a first AND circuit input coupled to the third comparator 75 circuit input and a second AND 78 circuit input coupled to the comparator 75 output terminal.

Furthermore, the limitation of “operable, in response thereto, to supply the switch control signal” in claim 5 has been considered, but does not result in a structural difference. The presence of process limitations in product claims, which product does not otherwise patentably distinguish over prior art, cannot impart patentability to that product. *In re Stephens*, 145 USPQ 656 (CCPA 1965).

Regarding claim 6, Clapp, III modified as taught by Matsuura and Kates et al. in claim 2 discloses the invention substantially as claimed, and Kates et al. (col. 4, lines 43-47) further teaches that the controller 140 circuit comprises a solenoid current monitoring circuit 150 electrically coupled.

Furthermore, the limitation of “to receive a signal representative of current magnitude flowing through the solenoid and operable, in response thereto, to supply the voltage signal representative of a current magnitude flowing through the solenoid” in claim 6 has been considered, but does not result in a structural difference. The presence of process limitations in product claims, which product does not otherwise patentably distinguish over prior art, cannot impart patentability to that product. *In re Stephens*, 145 USPQ 656 (CCPA 1965).

Regarding claim 7, Kates et al. (col. 3, lines 59-60) further teaches that the solenoid current monitoring circuit 150 comprises an amplifier circuit (col. 3, line 60) electrically coupled, and a timing circuit 160 coupled.

Furthermore, the limitations of “to receive the signal representative of the current magnitude flowing through the solenoid and operable to provide an amplified current magnitude

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signal”; and “to receive the amplified current magnitude signal and operable to supply the a voltage signal representative of a current magnitude flowing through the solenoid” in claim 7 have been considered, but do not result in a structural difference. The presence of process limitations in product claims, which product does not otherwise patentably distinguish over prior art, cannot impart patentability to that product. *In re Stephens*, 145 USPQ 656 (CCPA 1965).

Regarding claim 8, Clapp, III (figure 1) discloses a controller 14.

Furthermore, the limitation of “the controller supplies a first switch control signal to cause the first controllable switch to selectively open and close and a second switch control signal to cause the second controllable switch to open and close” in claim 8 has been considered, but does not result in a structural difference. The presence of process limitations in product claims, which product does not otherwise patentably distinguish over prior art, cannot impart patentability to that product. *In re Stephens*, 145 USPQ 656 (CCPA 1965).

Regarding claim 9, Clapp, III (figure 4) discloses that the first controllable switch 20 comprises a first MOSFET 84 having at least a gate terminal 86 electrically coupled, a source terminal 92 electrically coupled, and a drain terminal 88 electrically coupled; and the second controllable switch 22 comprises a second MOSFET 94 having at least a gate terminal 96 electrically coupled, a source terminal 98 electrically coupled, and a drain terminal 102 electrically coupled to a terminal of the diode 62.

Furthermore, the limitations of “to receive the first switch control signal” and “to receive the second switch control signal” in claim 9 have been considered, but do not result in a structural difference. The presence of process limitations in product claims, which product does

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not otherwise patentably distinguish over prior art, cannot impart patentability to that product. *In re Stephens*, 145 USPQ 656 (CCPA 1965).

Regarding claim 10, Clapp, III modified as taught by Matsuura and Kates et al. in claim 1 discloses the invention substantially as claimed including a solenoid (108 of Clapp, III), a second controllable switch (22 of Clapp, III), and a second resistor (71 of Matsuura) and a diode (62 of Clapp, III).

Furthermore, the limitation of “when the first controllable switch and the second controllable switch are closed, and current flows through the solenoid, the diode, and the first controllable switch when the first controllable switch is closed and the second controllable switch is open” in claim 10 has been considered, but does not result in a structural difference. The presence of process limitations in product claims, which product does not otherwise patentably distinguish over prior art, cannot impart patentability to that product. *In re Stephens*, 145 USPQ 656 (CCPA 1965).

Regarding claim 11, Clapp, III modified as taught by Matsuura and Kates et al. in claim 10 discloses the invention substantially as claimed including a solenoid (108 of Clapp, III), a first controllable switch (20 of Clapp, III), a second controllable switch (22 of Clapp, III), a first resistive element (115 of Kates et al.) and a diode (62 of Clapp, III).

Furthermore, the limitation of “wherein current flows through the solenoid, the diode, and the first resistive element when the first and second controllable switches are open after the being closed simultaneously for a predetermined time period” in claim 11 has been considered, but does not result in a structural difference. The presence of process limitations in product

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claims, which product does not otherwise patentably distinguish over prior art, cannot impart patentability to that product. *In re Stephens*, 145 USPQ 656 (CCPA 1965).

Regarding claim 12, Clapp, III (figure 1) discloses that a solenoid 108 is electrically coupled in parallel with the first controllable switch 20 and the diode 62.

Regarding claim 25, Clapp, III (figure 4) discloses a circuit comprising:

a first MOSFET 84 having at least a gate terminal 86, a source terminal 92, a drain terminal 88; a second MOSFET 94 having at least a gate terminal 96, a source terminal 98, a drain terminal 102, a diode 62 electrically coupled in series between the first MOSFET 84 drain terminal and the second MOSFET 94 source terminal, a solenoid 108, and a driver circuit 12 having at least a first input coupled, but lacks a first resistive element having a first terminal coupled to the first MOSFET source terminal and a second terminal electrically coupled to the first MOSFET drain terminal, a second resistor having a first terminal coupled to the second MOSFET source terminal, a comparator circuit having at least a first input terminal coupled to a reference voltage, a second input terminal coupled, and a third input terminal coupled, and a solenoid current monitoring circuit electrically coupled.

Kates et al. (col. 4, lines 43-47) teaches a first resistive element 115 having a first terminal coupled to the first MOSFET 110 source terminal and a second terminal electrically coupled to the first MOSFET 110 drain terminal.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the modified device of Clapp, III by providing a first resistive element having a first terminal coupled to the first MOSFET source terminal and a second terminal electrically coupled to the first MOSFET drain terminal in order to allow a small

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amount of current to flow from the power source to the load in view of the teachings of Kates et al.

Matsuura (col. 4, lines 45-52) teaches a second resistor 71 having a first terminal coupled to the second MOSFET 70 source terminal.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device of Clapp, III by providing a second resistor having a first terminal coupled to the second MOSFET source terminal in order to detect current in view of the teachings of Matsuura.

Matsuura (col. 4, lines 53-67) further teaches a comparator 75 circuit having at least a first input terminal coupled to a reference voltage, a second input terminal coupled, and a third input terminal. See figure 1.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the modified device of Clapp, III by providing a comparator circuit having at least a first input terminal coupled to a reference voltage, a second input terminal, and a third input terminal in order to drive the switching transistor in view of the teachings of Matsuura.

Furthermore, the limitations of “to receive a voltage signal representative of a current magnitude flowing through the solenoid”; “to receive the command signal, the comparator operable to supply a switch control signal based on the signals on the first, second, and third input terminals”; and “to receive the switch control signal and operable, in response thereto, to selectively open and close the second controllable switch” in claim 2 have been considered, but do not result in a structural difference. The presence of process limitations in product claims,

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which product does not otherwise patentably distinguish over prior art, cannot impart patentability to that product. *In re Stephens*, 145 USPQ 656 (CCPA 1965).

Kates et al. (col. 3, lines 59-60) further teaches that the solenoid current monitoring circuit 150 is electrically coupled.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the modified device of Clapp, III by providing that the solenoid current monitoring circuit is electrically coupled in order to measure the current flow through the switches to the load in view of the teachings of Kates et al.

Furthermore, the limitations of “to receive a signal representative of a magnitude of current flowing through the solenoid and operable, in response thereto, to supply the voltage signal representative of the current flowing through the solenoid” in claim 25 has been considered, but does not result in a structural difference. The presence of process limitations in product claims, which product does not otherwise patentably distinguish over prior art, cannot impart patentability to that product. *In re Stephens*, 145 USPQ 656 (CCPA 1965).

Also, the limitations of “to receive a command signal” and “to receive the switch control signal and operable, the driver circuit operable to selectively supply a first gate signal to the first MOSFET gate terminal in response to the command signal and to selectively supply a gate signal to the second MOSFET gate terminal in response to the switch control signal” in claim 25 have been considered, but do not result in a structural difference. The presence of process limitations in product claims, which product does not otherwise patentably distinguish over prior art, cannot impart patentability to that product. *In re Stephens*, 145 USPQ 656 (CCPA 1965).

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4. Claims 13-17 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Clapp, III in view of Matsuura.

Regarding Claim 13, Clapp, III (col. 2, lines 28-67) discloses a circuit comprising:
a diode 62 having at least a first diode terminal and a second diode terminal;
a first controllable switch 20 electrically coupled in series between the first diode 62 terminal and a first circuit terminal, the first circuit terminal adapted for coupling the circuit to a first predetermined voltage magnitude; a second controllable switch 22, and a controller circuit 14, but lacks a first resistive element having at least a first resistive element terminal and a second resistor terminal, the second resistor terminal electrically coupled to a second circuit terminal that is adapted for coupling the circuit to a second predetermined voltage magnitude, and a controllable switch electrically coupled in series between the second diode terminal and the first resistive element terminal.

Matsuura (col. 4, lines 45-52) teaches a first resistive element 71 having at least a first resistive element terminal and a second resistor terminal, the second resistor terminal electrically coupled to a second circuit terminal that is adapted for coupling the circuit to a second predetermined voltage magnitude and a controllable switch 70 electrically coupled in series.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device of Clapp, III by providing a first resistive element having at least a first resistive element terminal and a second resistor terminal, the second resistor terminal electrically coupled to a second circuit terminal that is adapted for coupling the circuit to a second predetermined voltage magnitude, and a controllable switch electrically coupled in series in order to detect current in view of the teachings of Matsuura.

Furthermore, the limitations of “operable to (i) selectively open and close the first controllable switch and the second controllable switch in response to a command signal and (ii) selectively open and close the second controllable switch based on a magnitude of current flow through the solenoid” in claim 13 have been considered, but do not result in a structural difference. The presence of process limitations in product claims, which product does not otherwise patentably distinguish over prior art, cannot impart patentability to that product. *In re Stephens*, 145 USPQ 656 (CCPA 1965).

Regarding claim 14, Clapp, III discloses the invention substantially as claimed including a driver circuit 12 having at least a first input 24 coupled to the switch control and a solenoid 108, but lacks a comparator circuit having at least a first input terminal coupled to a reference voltage, a second input terminal, and a third input terminal.

Matsuura (col. 4, lines 53-67) further teaches a comparator 75 circuit having at least a first input terminal coupled to a reference voltage, a second input terminal coupled, and a third input terminal. See figure 1.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device of Clapp, III by providing a comparator circuit having at least a first input terminal coupled to a reference voltage, a second input terminal, and a third input terminal in order to drive the switching transistor in view of the teachings of Matsuura.

Furthermore, the limitations of “to receive a voltage signal representative of a current magnitude flowing through the solenoid”; “to receive the command signal, the comparator operable to supply a switch control signal based on the signals on the first, second, and third input terminals”; and “to receive the switch control signal and operable, in response thereto, to

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selectively open and close the second controllable switch” in claim 14 have been considered, but do not result in a structural difference. The presence of process limitations in product claims, which product does not otherwise patentably distinguish over prior art, cannot impart patentability to that product. *In re Stephens*, 145 USPQ 656 (CCPA 1965).

Regarding claim 15, Clapp, III (figure 2) discloses a driver circuit 12 having at least a second input 104.

Furthermore, the limitation of “coupled to receive the command signal and operable, in response thereto, to selectively open and close the first controllable switch and the second controllable switch” in claim 15 has been considered, but do not result in a structural difference. The presence of process limitations in product claims, which product does not otherwise patentably distinguish over prior art, cannot impart patentability to that product. *In re Stephens*, 145 USPQ 656 (CCPA 1965).

Regarding claim 16, Clapp, III (figure 1) discloses that the controller 14 circuit further comprising an input circuit.

Furthermore, the limitation of “operable to condition the command signal and supply the conditioned command signal to the driver circuit second input and the comparator circuit third input” in claim 16 has been considered, but does not result in a structural difference. The presence of process limitations in product claims, which product does not otherwise patentably distinguish over prior art, cannot impart patentability to that product. *In re Stephens*, 145 USPQ 656 (CCPA 1965).

Regarding claim 17, Clapp, III (figure 1) discloses the invention substantially as claimed, and Matsuura further teaches a comparator 75 having a comparator output terminal (right of

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reference line 75 in figure1), and a logical AND 78 circuit having a first AND circuit input coupled to the third comparator 75 circuit input and a second AND 78 circuit input coupled to the comparator 75 output terminal.

Furthermore, the limitation of “operable, in response thereto, to supply the switch control signal” in claim 17 has been considered, but does not result in a structural difference. The presence of process limitations in product claims, which product does not otherwise patentably distinguish over prior art, cannot impart patentability to that product. *In re Stephens*, 145 USPQ 656 (CCPA 1965).

Regarding claim 24, Clapp, III (figure 1) discloses that a solenoid 108 is electrically coupled in parallel with the first controllable switch 20 and the diode 62.

5. Claims 18-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Clapp, III modified by Matsuura as applied to claim 14 above, and further in view of Kates et al.

Regarding claim 18, Clapp, III modified as taught by Matsuura in claim 14 discloses the invention substantially as claimed, but lacks a solenoid current monitoring circuit electrically coupled.

Kates et al. (col. 4, lines 43-47) teaches that the controller 140 circuit comprises a solenoid current monitoring circuit 150 electrically coupled.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the modified device of Clapp, III by providing a solenoid current monitoring circuit electrically coupled in order to determine the occurrence of a soft short or absolute short condition in view of the teachings of Kates et al.

Furthermore, the limitation of “to receive a signal representative of current magnitude flowing through the solenoid and operable, in response thereto, to supply the voltage signal representative of a current magnitude flowing through the solenoid” in claim 18 has been considered, but does not result in a structural difference. The presence of process limitations in product claims, which product does not otherwise patentably distinguish over prior art, cannot impart patentability to that product. *In re Stephens*, 145 USPQ 656 (CCPA 1965).

Regarding claim 19, Kates et al. (col. 3, lines 59-60) further teaches that the solenoid current monitoring circuit 150 comprises an amplifier circuit (col. 3, line 60) electrically coupled, and a timing circuit 160 coupled.

Furthermore, the limitations of “to receive the signal representative of the current magnitude flowing through the solenoid and operable to provide an amplified current magnitude signal”; and “to receive the amplified current magnitude signal and operable to supply the a voltage signal representative of a current magnitude flowing through the solenoid” in claim 19 have been considered, but do not result in a structural difference. The presence of process limitations in product claims, which product does not otherwise patentably distinguish over prior art, cannot impart patentability to that product. *In re Stephens*, 145 USPQ 656 (CCPA 1965).

Regarding claim 20, Clapp, III (figure 1) discloses a controller 14.

Furthermore, the limitation of “the controller supplies a first switch control signal to cause the first controllable switch to selectively open and close and a second switch control signal to cause the second controllable switch to open and close” in claim 20 has been considered, but does not result in a structural difference. The presence of process limitations in

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product claims, which product does not otherwise patentably distinguish over prior art, cannot impart patentability to that product. *In re Stephens*, 145 USPQ 656 (CCPA 1965).

Regarding claim 21, Clapp, III (figure 4) discloses that the first controllable switch 20 comprises a first MOSFET 84 having at least a gate terminal 86 electrically coupled, a source terminal 92 electrically coupled, and a drain terminal 88 electrically coupled; and the second controllable switch 22 comprises a second MOSFET 94 having at least a gate terminal 96 electrically coupled, a source terminal 98 electrically coupled, and a drain terminal 102 electrically coupled to a terminal of the diode 62.

Furthermore, the limitations of “to receive the first switch control signal” and “to receive the second switch control signal” in claim 21 have been considered, but do not result in a structural difference. The presence of process limitations in product claims, which product does not otherwise patentably distinguish over prior art, cannot impart patentability to that product. *In re Stephens*, 145 USPQ 656 (CCPA 1965).

Regarding claim 22, Clapp, III modified by Matsuura in claim 13 discloses the invention substantially as claimed including a solenoid (108 of Clapp, III), a second controllable switch (22 of Clapp, III), and a second resistor (71 of Matsuura) and a diode (62 of Clapp, III).

Furthermore, the limitation of “when the first controllable switch and the second controllable switch are closed, and current flows through the solenoid, the diode, and the first controllable switch when the first controllable switch is closed and the second controllable switch is open” in claim 22 has been considered, but does not result in a structural difference. The presence of process limitations in product claims, which product does not otherwise

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patentably distinguish over prior art, cannot impart patentability to that product. *In re Stephens*, 145 USPQ 656 (CCPA 1965).

Regarding claim 23, Clapp, III modified as taught by Matsuura discloses the invention substantially as claimed including a solenoid (108 of Clapp, III), a first controllable switch (20 of Clapp, III), a second controllable switch (22 of Clapp, III), and a diode (62 of Clapp, III), but lacks a first resistive element.

Kates et al. (col. 4, lines 43-47) teaches a first resistive element 115.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the modified device of Clapp, III by providing a first resistive element in order to allow a small amount of current to flow from the power source to the load in view of the teachings of Kates et al.

Furthermore, the limitation of “wherein current flows through the solenoid, the diode, and the first resistive element when the first and second controllable switches are open after the being closed simultaneously for a predetermined time period” in claim 23 has been considered, but does not result in a structural difference. The presence of process limitations in product claims, which product does not otherwise patentably distinguish over prior art, cannot impart patentability to that product. *In re Stephens*, 145 USPQ 656 (CCPA 1965).

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

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Foerster et al. U.S. Patent No. 5,711,280 discloses a solenoid, multiple switches, and a current monitor.

Miyazaki et al. U.S. Patent No. 5,909,199 discloses a solenoid, multiple switches, a diode, and a current monitor.

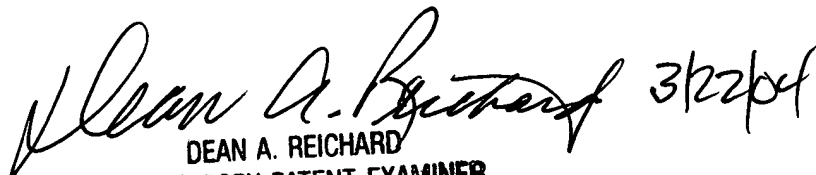
Henke U.S. Patent No. 5,729,422 discloses a solenoid, multiple switches, and a diode.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anton B Harris whose telephone number is (571) 272-1976. The examiner can normally be reached on weekdays from 8:30am to 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Dean Reichard, can be reached on (571) 272-2800 ext 31. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

abh

3/22/04

 3/22/04
DEAN A. REICHARD
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800